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681,298

No. 8545/50.

Date of filing Complete
Specification : April 5, 1951.

Application Date: April 5, 1950.

Complete Specification Published : Oct. 22, 1952.



Index at acceptance:—Class 80(i), A7f.

COMPLETE SPECIFICATION.

Improvements in or relating to Gear Cases for Motor Driven Appliances.

We, TARPEN ENGINEERING COMPANY LIMITED, a British Company, and JAMES WATT ROSS, a British Subject, both of Ixworth House, Ixworth Place, London, S.W.3, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to gear cases for motor driven appliances, such as for example planing and other machines driven by an electric motor mounted on or in the appliance.

Usually the gears mounted in the gear case are lubricated by filling the gear case about one third full with thin grease. In some cases it has been found that the appliance was liable to overheat due to the load on the gears, particularly due to difficulties in maintaining correct amount of grease in the gear case and in manufacturing a grade of grease which will lubricate high speed gears and not denature on account of excessive churning when the gear case is overfilled.

It is the object of the present invention to provide a construction of gear case by means of which the gears of the appliances referred to are effectively lubricated whilst liability to overheating is reduced to a minimum.

According to the present invention a gear case, for an appliance of the character referred to, provided in the upper portion thereof with a pocket for lubricating oil, the lower wall thereof being provided with a drip hole or holes, is characterised in that the top of the pocket is provided with a filling opening, for supplying lubricating oil to the pocket, normally closed by a plug, whilst an opening may be provided in one of the side walls or in the end wall of the gear case for determining the oil level in the gear case, the latter opening being normally closed by a plug.

One of the end walls of the pocket is preferably broken away so as to provide an opening near the upper end of one of the gear wheels located in the gear case so that oil which may be projected from this gear wheel by centrifugal force, as a result of rotation of the gear wheel, is returned to the pocket.

The invention will now be described by way of example, with reference to the accompanying drawing, which shows a vertical section of a gear case of a planing machine driven by an electric motor mounted in or on the machine.

As shown in the drawing, the gears 1, 2, 3 driven by an electric motor, in a casing 4, for operating the cutters of the machine, are mounted in a gear case 5 forming part of or suitably secured to the casing 4 containing the electric motor.

The gear case 5 receives the end 6 of the motor shaft on which is keyed the toothed wheel 1 gearing with a larger toothed wheel 2 which is mounted on a spindle 7, preferably by a ball bearing 8. The larger toothed wheel 2 gears with a second small toothed wheel 5 which actuates the planing cutters.

Inside the gear case 5 is provided a pocket 9 of which the bottom extends over the second small wheel 3 and of which one end extends over the larger toothed wheel 2. In a portion of this end of the pocket 9 is provided an opening 10 which extends partly over the upper portion of the larger toothed wheel 2.

In the bottom of the pocket is provided a drip feed hole 13 or holes, which is or are located above the second small toothed wheel 3, preferably towards the side thereof remote from the larger toothed wheel 2.

In the top of the gear case 5, above the pocket 9, is provided a filler hole 11 which is preferably closed by a screwed or other type of plug 12.

During rotation of the gear wheels, 1, 2, 3 the larger toothed wheel 2, rotating in

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the direction of the arrow 14, projects, by centrifugal force, at least some of the oil which it picks up from the bottom of the gear case 5 or which it may receive from 5 the second small toothed wheel 3, through the opening 10 in the wall of the pocket 9.

The pocket 9 is preferably formed as an integral casting with the gear case 5.

10 In use the pocket 9 is filled with lubricating oil to the level of the bottom of the opening 9 adjacent the large toothed wheel 2 and drips through the drip hole 13 in the bottom of the pocket 9 and sufficient oil 15 drips through into the bottom of the gear case 5 for adequately lubricating the toothed wheels 1, 2, 3.

With an arrangement as above described the minimum amount of oil is used, the 20 grade is not critical, the load is taken off the toothed wheels 1, 2, 3 and thus more power is available for cutting, and the machine runs cool and is thus efficient in use.

25 The gear case 5 may be formed as an aluminium casting or of any other suitable non-ferrous material or even of cast-iron or cast-steel.

The casting 5 is provided with an open- 30 ing 15 closed by a plug 16 for determining

the oil level in said casing 5.

What we claim is:—

1. A gear case for an appliance of the character referred to, provided in the upper portion thereof with a pocket for 35 lubricating oil, the lower wall of the pocket being provided with a drip hole or holes, characterised in that the top of the pocket is provided with a filling opening, normally closed by a plug, whilst an open- 40 ing is provided in one of the side walls or in the end wall of the gear case for determining the oil level in the gear case, the latter opening being normally closed by a 45 plug.

2. A gear case according to Claim 1, wherein one of the end walls of the pocket is broken away so as to provide an opening near the upper end of one of the gear wheels located in the gear case so that oil 50 which may be projected from this gear wheel by centrifugal force is returned to the pocket.

3. A gear case for an appliance of the character referred to, substantially as here- 55 inbefore described and as shown in the accompanying drawing.

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PROVISIONAL SPECIFICATION.

Improvements in or relating to Gear Cases for Motor Driven Appliances.

We, TARPEN ENGINEERING COMPANY LIMITED, a British Company, and JAMES 60 WATT ROSS, a British Subject, both of 1xworth House, 1xworth Place, London, S.W.3, do hereby declare this invention to be described in the following statement:

This invention relates to motor driven 65 appliances, such as for example planing and other machines driven by an electric motor mounted on or in the appliance, which latter is manipulated by hand.

Usually the gears mounted in a gear case 70 are lubricated by filling the gear case about one third full with thin grease. In some cases it has been found that the appliance was liable to overheat due to the load on the gears, particularly due to difficulties 75 in maintaining correct amount of grease in the gear case and in manufacturing a grade of grease which will lubricate high speed gears and not denature on account of excessive churning when the gear case is 80 overfilled.

It is the object of the present invention to provide a construction of gear case by means of which the gears of the appliances referred to are effectively lubricated whilst 85 liability to overheating is reduced to a minimum.

According to the present invention a

gear case of an appliance of the character referred to is provided in the upper portion thereof with a pocket for lubricating 90 oil, the lower wall being provided with a drip hole or holes.

The gear case is preferably provided in the top thereof with a filling opening, for supplying lubricating oil to the pocket, 95 normally closed by a plug, whilst an opening may be provided in one of the side walls or in the end wall of the gear case for determining the oil level in the gear case, the latter opening being preferably 100 closed by a plug.

One of the end walls of the pocket is preferably broken away so as to provide an opening near the upper end of one of the gear wheels located in the gear case so 105 that any oil which may be projected from this gear wheel by centrifugal force, as a result of rotation of the gear wheel, is returned to the pocket.

In carrying the invention into effect ac- 110 cording to one example of construction as applied to a planing machine driven by an electric motor mounted in or on the machine, the gears, driven by the electric 115 motor, for operating the cutters of the machine, are mounted in a gear case forming part of or suitably secured to a casing

containing the electric motor.

The gear case receives the end of the motor shaft on which is keyed a toothed wheel gearing with a larger toothed wheel which is mounted on a spindle, preferably by a ball bearing. The larger toothed wheel gears with a second small toothed wheel which actuates the planing cutters.

Inside the gear case is provided a pocket of which the bottom extends over the second small wheel and of which one end extends over the larger toothed wheel. In a portion of this end of the pocket is provided an opening which extends partly over the upper portion of the larger toothed wheel.

In the bottom of the pocket is provided a drip feed hole or holes, which is or are located above the second small toothed wheel, preferably towards the side thereof remote from the larger toothed wheel.

In the top of the gear case, above the pocket, is provided a filler hole which is preferably closed by a screwed or other type of plug.

During rotation of the gear wheels, the larger toothed wheel projects, by centrifugal force, at least some of the oil which

it picks up from the bottom of the gear case or which it may receive from the second small toothed wheel through the opening in the wall of the pocket.

The pocket is preferably formed as an integral casting with the gear case.

In use the pocket is filled with lubricating oil to the level of the bottom of the opening adjacent the large toothed wheel and drips through the drip hole in the bottom of the pocket and sufficient oil drips through into the bottom of the gear case for adequately lubricating the toothed wheels.

With an arrangement as above described the minimum amount of oil is used, the grade is not critical, the load is taken off the toothed wheels and thus more power is available for cutting, and the machine runs cool and is thus efficient in use.

The gear case may be formed as an aluminium casting or of any other suitable non-ferrous material or even of cast-iron or cast-steel.

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Printed for Her Majesty's Stationery Office by Wickes & Andrews, Ltd., E.C.4 39/244-1952.
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2. from which copies may be obtained.

